



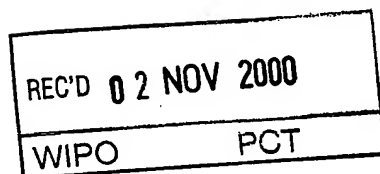
The
Patent
Office

PCT/EP 00/09292 7/9/02
10/08-708 4 #12

INVESTOR IN PEOPLE

EP00109292

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ



I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.

Signed

Dated: 31 August 2000

**PRIORITY
DOCUMENT**

SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH RULE 17.1(a) OR (b)

THIS PAGE BLANK (USPTO)

Patents Form 1/77

THE PATENT OFFICE
A
- 1 OCT 1999
RULE 97
NEWPORT

**The
Patent
Office**

1/77
04 OCT 99 E451123- C51942
F01/7700 0.00 - 9923273.8

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

01 OCT 1999

1. Your Reference	CGP/PG3786
2. Patent application number (The Patent office will fill in this part)	9923273.8
3. Full name, address and postcode of the or of each applicant (underline all surnames)	GLAXO GROUP LIMITED GLAXO WELLCOME HOUSE BERKELEY AVENUE GREENFORD MIDDLESEX UB6 ONN UNITED KINGDOM

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its corporation

473687003ma

4. Title of the invention	MEDICAMENT DELIVERY SYSTEM		
5. Name of your agent (if you have one)	DR CHRISTOPHER GERARD PIKE PIKE & CO. HAYES LOFT 68A HAYES PLACE MARLOW BUCKS SL7 2BT		
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)			

7497928002ma

6. If you are declaring priority from one or more earlier patent applications, give the country and date of filing of the or of each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of Filing (day / month / year)
7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application		Date of filing (day / month / year)

8. Is a statement of inventorship and of right to grant a patent required in support of this request? (Answer yes if: a) any applicant named in part 3 is not an inventor, or b) there is an inventor who is not named as an applicant, or c) any named applicant is a corporate body. See note (d))	YES
--	-----

Patents Form 1/77

Patents Form 1/77

Enter the number of sheets for any of the following items you are filing in this form. Do not count copies of the same document

Continuation sheets of this form 0

Description 13/

Claim(s) 7/ *25/1*

Abstract 1/

Drawing(s) 2+2

10. If you are also filing any of the following, state how many against each item.

Priority Documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patent Form 9/77*)

Request for substantive examination (*Patent Form 10/77*)

Any other documents
(please specify)

11. I/We request the grant of a patent on the basis of this application

Signature Christopher Gerard Pike
AGENT FOR THE APPLICANTS

30 September 1999

12. Name and daytime telephone number of person to contact in the United Kingdom **Dr. Christopher G. Pike**
01628 471869

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patent Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

- If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered "Yes" Patents Form 7/77 will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.

Medicament delivery system

5 The present invention relates to a system for the delivery of medicament having an electronic data management system. The system is capable of wireless communication with a gateway to a network computer system to enable communication of data between the network computer system and the electronic data management system.

10 It is common prescribing practice for a doctor to prescribe a patient with medicament in a medicament dispenser together with instructions for patient administration of the medicament according to a defined treatment regime. The patient typically therefore, receives instructions relating to the correct use of the dispenser together with recommended dosing amounts, dose intervals and
15 treatment period. The patient is then trusted to follow the treatment regime as set by the doctor.

A limitation associated with this practice is that the treatment regime is set at the time of prescription and can therefore not account for changes in the patient's
20 condition over the treatment period. A further limitation associated with this practice is that the onus is on the patient to comply with the doctor's instructions. Occasionally, patients will forget to take the medicament or will vary the treatment regime in an unpredictable manner with possible consequences for the success of the treatment.

25 A variation on the above-described prescribing practice involves the use by a patient of a diagnostic device which enables data relating to their medical condition to be gathered on a regular basis. This data may for example, be collected prior to administration of any medicament and a correct dose amount
30 calculated on the basis of the diagnostic data. An example of this practice would be that of a diabetic who checks their blood-sugar levels in order to calculate a required dose of insulin.

35 In developments of the practice variation, the diagnostic device may be integrated with the delivery system. Information relating to the patient's condition

and usage of the dispenser may thus be displayed to the patient to enable the better management of their medical condition. The information may further be stored in a memory such that it may be recalled at a later time to enable historic analysis of the progress of the condition and effect of the treatment. Dispensers
5 employing electronic data management systems have been proposed for this purpose.

US-A-5,363,842 describes an inhalation device for use in delivering inhalable medicament. The device enables data relating to the patient's breathing pattern
10 to be collected, analysed and displayed to the patient. The data is stored in a memory for download to a workstation at the clinic.

WO99/35588 describes a method for managing the administration of medicine and in particular, monitoring patient compliance with a prescribed treatment
15 regime. The method relies on input of patient data to a central computer workstation. The central computer workstation calculates and transmits dosage data to a dispensing device via a communications link. The dispensing device delivers drug in accord with the dosage data.

The Applicants have now developed an improved system for the delivery of medicament which employs an electronic data management system. The system is capable of communication with a gateway to a network computer system to enable communication of data between the network computer system and the electronic data management system. The system therefore, provides the
20 advantage of enabling data transfer with a network of computers, which network can be made accessible to diverse remote information sources, which may in turn be networked together for cross-transfer of data. The patient therefore, has ready access to diverse, possibly inter-connected, remote information sources capable of providing disease management information. In turn, the system can
25 feed information, such as compliance information, back to any remote information source having access to the computer network system.

According to one aspect of the present invention there is provided a system for the delivery of medicament comprising a medicament container; a dispensing
35 mechanism for dispensing medicament from the medicament container; an

electronic data management system; and a communicator for wireless communication with a gateway to a network computer system to enable transfer of data between the network computer system and the electronic data management system.

5

The electronic data management system comprises a memory for storage of data; a microprocessor for performing operations on said data; and a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data.

10

Preferably, the communicator enables two-way transfer of data between the network computer system and the electronic data management system.

15

Preferably, the data is communicable between the network computer system and the electronic data management system in encrypted form. All suitable methods of encryption or partial encryption are envisaged. Password protection may also be employed.

20

Preferably, the communicator employs radiofrequency or optical signals.

25

In one aspect, the communicator communicates directly with the gateway.

30

In another aspect, the communicator communicates with the gateway via a second communications device. Preferably, the second communications device is a telecommunications device, more preferably a cellular phone or pager. Preferably, the communicator communicates with the second communications device using spread spectrum radiofrequency signals. A suitable spread spectrum protocol is the Bluetooth (trade mark) standard which employs rapid (e.g. 1600 times a second) hopping between plural frequencies (e.g. 79 different frequencies). The protocol may further employ multiple sending of data bits (e.g. sending in triplicate) to reduce interference.

35

In one aspect, the network computer system comprises a public access network computer system. The internet is one suitable example of a public access network computer system, wherein the gateway can be any suitable gateway

thereto including gateways managed by an internet service provider. The public access network computer system may also form part of a telecommunications system, which may itself be either a traditional copper wire system, a cellular system or an optical network.

5

In another aspect, the network computer system comprises a private access network computer system and the gateway is a secure gateway. The private access network system may for example, comprise an intranet or extranet which may for example, be maintained by a health service provider or medicament manufacturer. The secure gateway may for example include password protection; a firewall; and suitable encryption means.

10

Preferably, the communicator enables communication with a user-specific network address in the network computer system.

15

The user-specific network address may be selected from the group consisting of a web-site address, an e-mail address and a file transfer protocol address. Preferably, the user-specific network address is accessible to a remote information source such that information from said remote information source can be made available thereto. More preferably, information from the user-specific network address can be made available to the remote information source.

20

In one aspect, the remote information source is a medicament prescriber, for example a doctor's practice. Information transferred from the medicament prescriber may thus, comprise changes to prescription details, automatic prescription updates or training information. Information transferred to the medicament prescriber may comprise compliance information, that is to say information relating to the patient's compliance with a set prescribing programme. Patient performance information relating for example, to patient-collected diagnostic data may also be transferred to the medicament prescriber. Where the dispenser is an inhaler for dispensing medicament for the relief of respiratory disorders examples of such diagnostic data would include breath cycle data or peak flow data.

25

30

35

In another aspect, the remote information source is a pharmacy. Information transferred from the pharmacy may thus, comprise information relating to the medicament product. Information sent to the pharmacy may thus include prescription requests which have been remotely pre-authorized by the medicament prescriber.

In a further aspect, the remote information source is an emergency assistance provider, for example a hospital accident and emergency service or an emergency helpline or switchboard. The information may thus, comprise a distress or emergency assist signal which requests emergency assistance.

In a further aspect, the remote information source is a manufacturer of medicament or medicament delivery systems. Information transferred to the system may thus, comprise product update information. The system may also be configured to feed information back to the manufacturer relating to system performance.

In a further aspect, the remote information source is a research establishment. In a clinical trials situation, information may thus be transferred relating to the trials protocol and information relating to patient compliance fed back to the research establishment.

In a further aspect, the remote information source is an environmental monitoring station. Information relating to weather, pollen counts and pollution levels may thus be made accessible to the system.

Preferably, the system additionally comprises a datalink for linking to a local data store such as a personal computer or set-top box to enable communication of data between the local data store and the microprocessor. Preferably, the datalink comprises an infrared emitter and sensor.

Preferably, the system additionally comprises a data input system for user input of data to the electronic data management system. More preferably, the data input system comprises a keypad.

Preferably, the system additionally comprises a display for display of data from the electronic data management system to the user. The display may for example, comprise a screen such as an LED or LCD screen.

5 Preferably, the electronic data management system includes a predictive algorithm or look-up table for calculating the optimum amount of medicament to dispense.

10 Preferably, the memory includes a dose memory for storing dosage data and reference is made to the dose memory in calculating the optimum amount of medicament to dispense.

15 Preferably, the system additionally comprises a selector for selecting the amount of medicament to dispense from said dispensing mechanism.

In one aspect, the selector is manually operable.

20 In another aspect, the selector is operable in response to a signal from the transmitter.

25 Preferably, the system additionally comprises a detector for detecting dispensing from the medicament container, wherein said detector communicates dispensing data to the electronic data management system.

30 Preferably, the system additionally comprises a geographic positioning system such as a global positioning system or a system which relies on the use of multiple communications signals and a triangulation algorithm.

35 In one aspect, the system is suitable for the delivery of inhalable medicament and additionally comprises a sensor which senses the breath of a user, wherein the sensor communicates breath data to the electronic data management system.

In one aspect, the sensor comprises an breath-movable element which is movable in response to the breath of a patient. More preferably, the breath-

movable element is selected from the group consisting of a vane, a sail, a piston and an impeller.

5 In another aspect, the sensor comprises a pressure sensor for sensing the pressure profile associated with the breath of a user.

In a further aspect, the sensor comprises an airflow sensor for sensing the airflow profile associated with the breath of a user.

10 In a further aspect, the sensor comprises a temperature sensor for sensing the temperature profile associated with the breath of a user. The temperature of the inhaled and exhaled part of the breath cycle varies and may, thus, be used as a measurement tool.

15 In a further aspect, the sensor comprises a moisture sensor for sensing the moisture profile associated with the breath of a user. The moisture content of the inhaled and exhaled part of the breath cycle varies and this also may be used as a measurement tool.

20 In a further aspect, the sensor comprises a gas sensor for sensing the oxygen or carbon dioxide profile associated with the breath of a user. The chemical profile of the inhaled and exhaled part of the breath cycle varies and this further may be used as a measurement tool.

25 Preferably, the breath data includes breath cycle data or peak flow data.

Preferably, the system additionally comprises an actuator for actuating the dispensing mechanism, said actuator being actuatable in response to a trigger signal from the transmitter.

30 Preferably, the electronic data management system includes a predictive algorithm or look-up table for deriving from the breath data when to transmit the trigger signal. For example, a real-time analysis of the patient breath waveform may be made and the trigger point derived by reference to that analysed waveform.
35

In one preferred aspect, the medicament container is an aerosol container and the dispensing mechanism is an aerosol valve.

- 5 In another preferred aspect, the medicament container is a dry-powder container, that is to say a container suitable for containing medicament in dry-powder form.

10 Preferably, the actuator comprises an energy store for storing energy which energy is releasable to actuate the dispensing mechanism of the medicament container. The energy store comprises in preferred aspects, a biasable resilient member such as a spring, a source of compressed fluid such as a canister of compressed gas or a battery. Chemical energy sources are also suitable and might include chemical propellant or ignition mixtures. Other sources might
15 include physical explosives such as liquefied or solidified gas in a canister which burst when heated or exposed to the atmosphere.

The system may additionally comprise a safety mechanism to prevent unintended multiple actuations of the actuator. The patient is thereby protected
20 from inadvertently receiving multiple doses of medicament in a situation where they take a number of short rapid breaths. More preferably, the safety mechanism imposes a time delay between successive actuations of the actuator. The time delay is typically of the order of from three to thirty seconds.

- 25 An actuation counter which can be mechanical or electronic may be provided to the system.

A medicament dispensing counter, such as a dose counter, may be provided to the system. This may be mechanical or electronic. The counter may be coupled
30 to a visual display to provide feedback to the patient as to amount of drug released or remaining in the container.

A manual override can be provided to the system for use in the event of emergency or system failure.

According to another aspect of the present invention there is provided a data communicator for use with a medicament dispenser comprising an electronic data management system; a communicator for communicating with a gateway to a network computer system to enable communication of data between the network computer system and the microprocessor; and a coupling mechanism for coupling the data communicator to the medicament dispenser.

The electronic data management system comprises a memory for storage of data; a microprocessor for performing operations on said data; and a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data;

According to another aspect of the present invention there is provided a kit of parts comprising a data communicator as described above and a medicament dispenser comprising a medicament container; and a dispensing mechanism for dispensing medicament from the medicament container.

The data communicator may for example, be mechanically coupled to the medicament dispenser by any suitable mechanical mechanism including grip mechanisms and snap-fit mechanisms. In a preferred aspect, the data communicator forms a snap-in module and the dispenser is shaped for receipt of the module.

In aspects, the data communicator or any distinct device aspects of the system may be adapted to be worn on the body of the user. Examples would include belt attachable devices, devices in the form of watches for wrist or leg attachment and devices attachable as jewellery. Suitable body attachment means will be incorporated as required.

Embodiments of systems according to the invention will now be described with reference to the accompanying drawings in which:

Figure 1. is a schematic representation of a first system in accord with the present invention; and

Figure 2. is a schematic representation of a second system in accord with the present invention.

Figure 1. shows a standard-form metered dose inhaler for the delivery of inhalable medicament comprising a tubular housing 10 in which an aerosol container 12 is located. The housing is open at one end (which will hereinafter be considered to be the top of the device for convenience of description) and is closed at the other. An dispensing outlet 14 leads laterally from the closed end of the housing 1. In the embodiment illustrated, the outlet 14 is in the form of a mouthpiece intended for insertion into the mouth of the patient but it may, if desired, be designed as a nozzle for insertion into the patient's nostril.

The aerosol container 12 is located in the housing 10 so that one end protrudes from the open top of the housing 10. The aerosol container 12 has an outlet valve stem (not visible) at one end which connects with a support (not shown) in the housing 10. To dispense the dose, the protruding portion of the aerosol container 12 is depressed to move the container 12 relative to the valve stem to open the valve and dispense medicament into the outlet 14 from which it can be inhaled by a patient.

The dispenser includes an electronic data management system in the form of a chip comprised within the housing (not visible). The user may access the electronic data management system by use of push-buttons 20 and toggle menu-button 24. Display 30 allows for display of menu choices and data from the electronic data management system. The dispenser communicates via communications chip 40 to computer network system 50. The computer network system 50 comprises a secure extranet computer system. Remote information sources 60, 62, 64, 66, 68 also have access to the extranet. In more detail, the remote information sources comprise a medicament prescriber 60, a pharmacy 62, a weather monitoring station 64, a pollution monitoring station 66 and a medicament manufacturer 68. Two-way data transfer is possible between the electronic data management system and the computer network system 50 via the communications chip 40. Information transfer is thus possible between the electronic data management system and any of the remote information sources 60, 62, 64, 66, 68.

Figure 2. shows a variation of the system of Figure 2. The system comprises standard-form metered dose inhaler for the delivery of inhalable medicament comprising tubular housing 110, an aerosol container 112 and dispensing outlet 114. Operation of the inhaler is as described above with reference to Figure 1.

The dispenser includes an electronic data management and communications system in the form of a chip 140 comprised within the housing 110. Display 130 allows for limited display data from the electronic data management system. The dispenser readily communicates via chip 140 to palmtop computer 170. The communication is via spread spectrum radiofrequency signals operable over a relatively short range (e.g. up to ten metres). The palmtop computer 170 has a more sophisticated display 172 including a graphical user interface comprising menu-entry screens from which selections may be made using toggle menu-button 174.

The user accesses the electronic data management system 140 of the dispenser through the palmtop computer 170. The palmtop computer 170 itself, can communicate through a telecommunications link with computer network system 150. The computer network system 150 comprises a secure extranet computer system. As in Figure 1, remote information sources may also have access to the extranet. Two-way data transfer is possible between the electronic data management system and the computer network system 150 via the communications links with the palmtop computer 170. Information transfer is thus possible between the electronic data management system 140, palmtop computer 170 and any of the remote information sources.

The system of the invention is in one aspect suitable for dispensing medicament for the treatment of respiratory disorders such as disorders of the lungs and bronchial tracts including asthma and chronic obstructive pulmonary disorder (COPD).

Appropriate medicaments may be selected from, for example, analgesics, e.g., codeine, dihydromorphine, ergotamine, fentanyl or morphine; anginal preparations, e.g., diltiazem; antiallergics, e.g., cromoglycate, ketotifen or

nedocromil; antiinfectives e.g., cephalosporins, penicillins, streptomycin, sulphonamides, tetracyclines and pentamidine; antihistamines, e.g., methapyrilene; anti-inflammatories, e.g., beclomethasone dipropionate, fluticasone propionate, flunisolide, budesonide, rofleponide, mometasone furoate or triamcinolone acetonide; antitussives, e.g., noscapine; bronchodilators, e.g., albuterol, salmeterol, ephedrine, adrenaline, fenoterol, formoterol, isoprenaline, metaproterenol, phenylephrine, phenylpropanolamine, pirbuterol, reproterol, rimiterol, terbutaline, isoetharine, tulobuterol, or (-)-4-amino-3,5-dichloro- α -[[[6-[2-(2-pyridinyl)ethoxy] hexyl]methyl] benzenemethanol; diuretics, e.g., amiloride; anticholinergics, e.g., ipratropium, tiotropium, atropine or oxitropium; hormones, e.g., cortisone, hydrocortisone or prednisolone; xanthines, e.g., aminophylline, choline theophyllinate, lysine theophyllinate or theophylline; therapeutic proteins and peptides, e.g., insulin or glucagon. It will be clear to a person skilled in the art that, where appropriate, the medicaments may be used in the form of salts, (e.g., as alkali metal or amine salts or as acid addition salts) or as esters (e.g., lower alkyl esters) or as solvates (e.g., hydrates) to optimise the activity and/or stability of the medicament.

Preferred medicaments are selected from albuterol, salmeterol, fluticasone propionate and beclomethasone dipropionate and salts or solvates thereof, e.g., the sulphate of albuterol and the xinafoate of salmeterol.

Medicaments can also be delivered in combinations. Preferred formulations containing combinations of active ingredients contain salbutamol (e.g., as the free base or the sulphate salt) or salmeterol (e.g., as the xinafoate salt) in combination with an antiinflammatory steroid such as a beclomethasone ester (e.g., the dipropionate) or a fluticasone ester (e.g., the propionate).

It will be understood that the present disclosure is for the purpose of illustration only and the invention extends to modifications, variations and improvements thereto.

The application of which this description and claims form part may be used as a basis for priority in respect of any subsequent application. The claims of such subsequent application may be directed to any feature or combination of

features described therein. They may take the form of product, method or use claims and may include, by way of example and without limitation, one or more of the following claims:

CLAIMS:

1. A system for the delivery of medicament comprising

5 a medicament container;

a dispensing mechanism for dispensing medicament from the medicament container;

10 an electronic data management system comprising

a memory for storage of data;

15 a microprocessor for performing operations on said data; and

a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data; and

20 a communicator for wireless communication with a gateway to a network computer system to enable transfer of data between the network computer system and the electronic data management system.

2. A system according to claim 1, wherein the communicator enables two-way transfer of data between the network computer system and the electronic data management system.

3. A system according to either of claims 1 or 2, wherein the data is communicable between the network computer system and the electronic data management system in encrypted form.

4. A system according to any of claims 1 to 3, wherein the communicator employs radiofrequency or optical signals.

5. A system according to any of claims 1 to 4, wherein the communicator communicates directly with the gateway.

6. A system according to any of claims 1 to 4, wherein the communicator communicates with the gateway via a second communications device.

5 7. A system according to claim 6, wherein the second communications device is a telecommunications device.

8. A system according to claim 7, wherein the telecommunications device comprises a cellular phone or pager.

10

9. A system according to any of claims 6 to 8, wherein the communicator communicates with the second communications device using spread spectrum radiofrequency signals.

15

10. A system according to any of claims 1 to 9, wherein the network computer system comprises a public access network computer system.

11. A system according to any of claims 1 to 9, wherein the network computer system comprises a private access network computer system and the gateway is a secure gateway.

20

12. A system according to any of claims 1 to 11, wherein the communicator enables communication with a user-specific network address in the network computer system.

25

13. A system according to claim 12, wherein the user-specific network address is selected from the group consisting of a web-site address, an e-mail address and a file transfer protocol address.

30

14. A system according to either of claims 12 or 13, wherein the user-specific network address is accessible to a remote information source such that information from said remote information source can be made available thereto.

15. A system according to claim 14, wherein information from the user-specific network address can be made available to the remote information source.

5 16. A system according to either of claims 14 or 15, wherein the remote information source is a medicament prescriber.

17. A system according to either of claims 14 or 15, wherein the remote information source is a pharmacy.

10

18. A system according to either of claims 14 or 15, wherein the remote information source is an emergency assistance provider.

15 19. A system according to either of claims 14 or 15, wherein the remote information source is a manufacturer of medicament or medicament delivery systems.

20. A system according to either of claims 14 or 15, wherein the remote information source is a research establishment.

20

21. A system according to claim 15, wherein the remote information source is an environmental monitoring station.

25 22. A system according to any of claims 1 to 21, additionally comprising a datalink for linking to a local data store to enable communication of data between the local data store and the microprocessor.

23. A system according to claim 22, wherein the datalink comprises an infrared emitter and sensor.

30

24. A system according to either of claims 22 or 23, wherein the local data store comprises a personal computer or set-top box.

25. A system according to any of claims 1 to 24, additionally comprising a data input system for user input of data to the electronic data management system.

5 26. A system according to claim 25, wherein said data input system comprises a keypad.

10 27. A system according to any of claims 1 to 26, additionally comprising a display for display of data from the electronic data management system to the user.

15 28. A system according to any of claims 1 to 27, wherein said electronic data management system includes a predictive algorithm or look-up table for calculating the optimum amount of medicament to dispense.

29. A system according to claim 28, wherein the memory includes a dose memory for storing dosage data and reference is made to the dose memory in calculating the optimum amount of medicament to dispense.

20 30. A system according to any of claims 1 to 29, additionally comprising a selector for selecting the amount of medicament to dispense from said dispensing mechanism.

25 31. A system according to claim 30, wherein the selector is manually operable.

32. A system according to claim 31, wherein the selector is operable in response to a signal from the transmitter.

30 33. A system according to any of claims 1 to 32, additionally comprising a detector for detecting dispensing from the medicament container, wherein said detector communicates dispensing data to the electronic data management system.

34. A system according to any of claims 1 to 33, additionally comprising a geographic positioning system.

5 35. A system for the delivery of inhalable medicament according to any of claims 1 to 34 additionally comprising a sensor which senses the breath of a user, wherein the sensor communicates breath data to the electronic data management system.

10 36. A system according to claim 35, wherein said sensor comprises an breath-movable element which is movable in response to the breath of a patient.

37. A system according to claim 36, wherein said breath-movable element is selected from the group consisting of a vane, a sail, a piston and an impeller.

15 38. A system according to claim 35, wherein the sensor comprises a pressure sensor for sensing the pressure profile associated with the breath of a user.

20 39. A system according to claim 35, wherein the sensor comprises an airflow sensor for sensing the airflow profile associated with the breath of a user.

25 40. A system according to claim 35, wherein the sensor comprises a temperature sensor for sensing the temperature profile associated with the breath of a user.

41. A system according to claim 35, wherein the sensor comprises a moisture sensor for sensing the moisture profile associated with the breath of a user.

30 42. A system according to claim 35, wherein the sensor comprises a gas sensor for sensing the oxygen or carbon dioxide profile associated with the breath of a user.

35 43. A system according to any of claims 35 to 42, wherein said breath data includes breath cycle data.

44. A system according to any of claims 35 to 42, wherein said breath data includes peak flow data.

5 45. A system according to any of claims 35 to 44, additionally comprising an actuator for actuating the dispensing mechanism, said actuator being actuable in response to a trigger signal from the transmitter.

10 46. A system according to claim 45, wherein the electronic data management system includes a predictive algorithm or look-up table for deriving from the breath data when to transmit the trigger signal.

15 47. A system according to any of claims 35 to 46, wherein said medicament container is an aerosol container and the dispensing mechanism is an aerosol valve.

48. A system according to any of claims 35 to 46, wherein said medicament container is a dry-powder container.

20 49. A system according to any of claims 45 to 48, wherein said actuator comprises an energy store for storing energy which energy is releasable to actuate the dispensing mechanism of the medicament container.

25 50. A data communicator for use with a medicament dispenser comprising an electronic data management system comprising

a memory for storage of data;

30 a microprocessor for performing operations on said data; and

a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data;

a communicator for communicating with a gateway to a network computer system to enable communication of data between the network computer system and the microprocessor; and

- 5 a coupling mechanism for coupling the data communicator to the medicament dispenser.

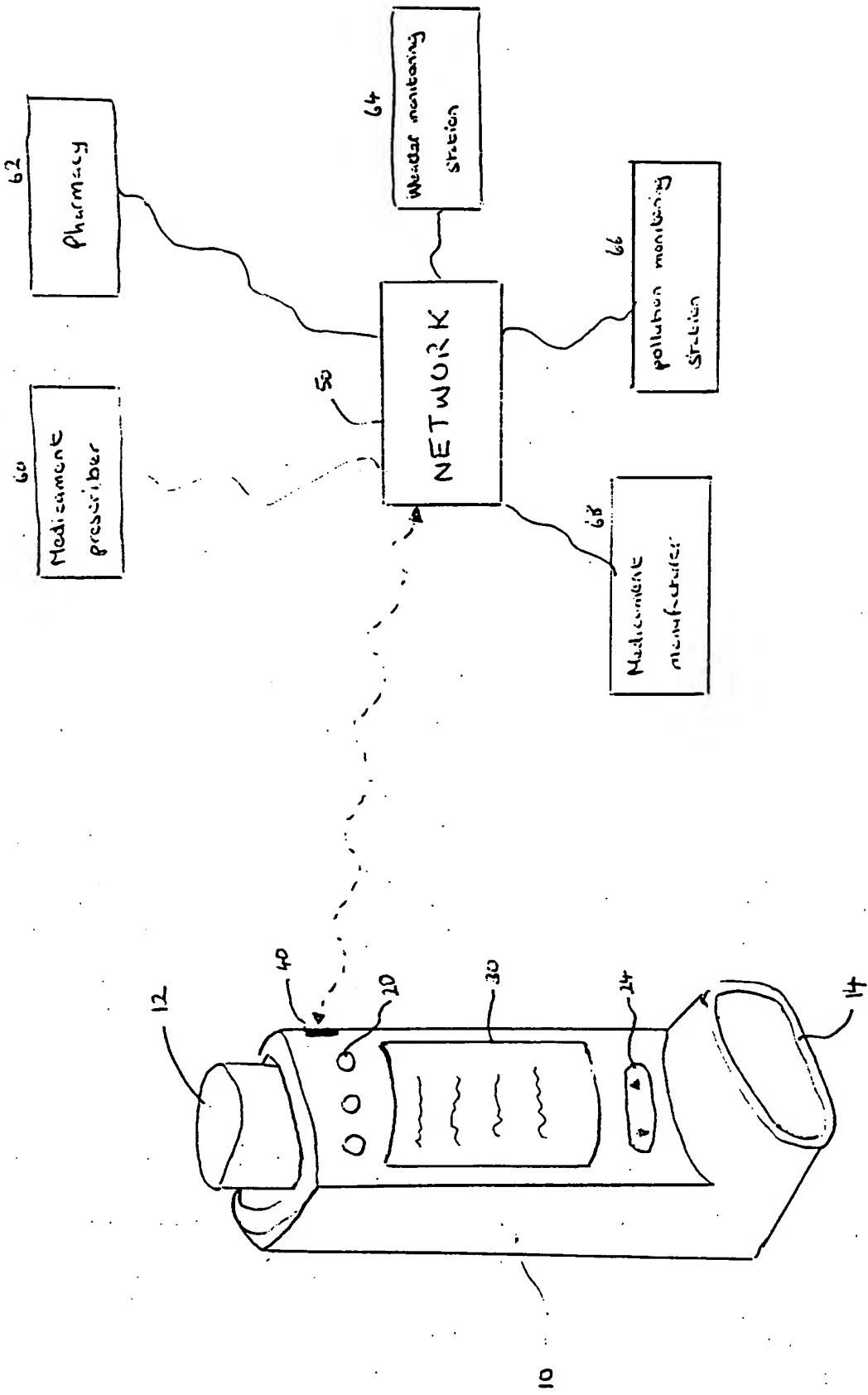
51. Kit of parts comprising a data communicator according to claim 50 and
a medicament dispenser comprising a medicament container; and a dispensing
10 mechanism for dispensing medicament from the medicament container.

ABSTRACT

5 There is provided a system for the delivery of medicament comprising a
medicament container; a dispensing mechanism for dispensing medicament
from the medicament container; and a communicator for wireless communication
with a gateway to a network computer system to enable communication of data
between the network computer system and the electronic data management
system. The electronic data management system comprises a memory for
storage of data; a microprocessor for performing operations on the data; and a
10 transmitter for transmitting a signal relating to the data or the outcome of an
operation on the data.

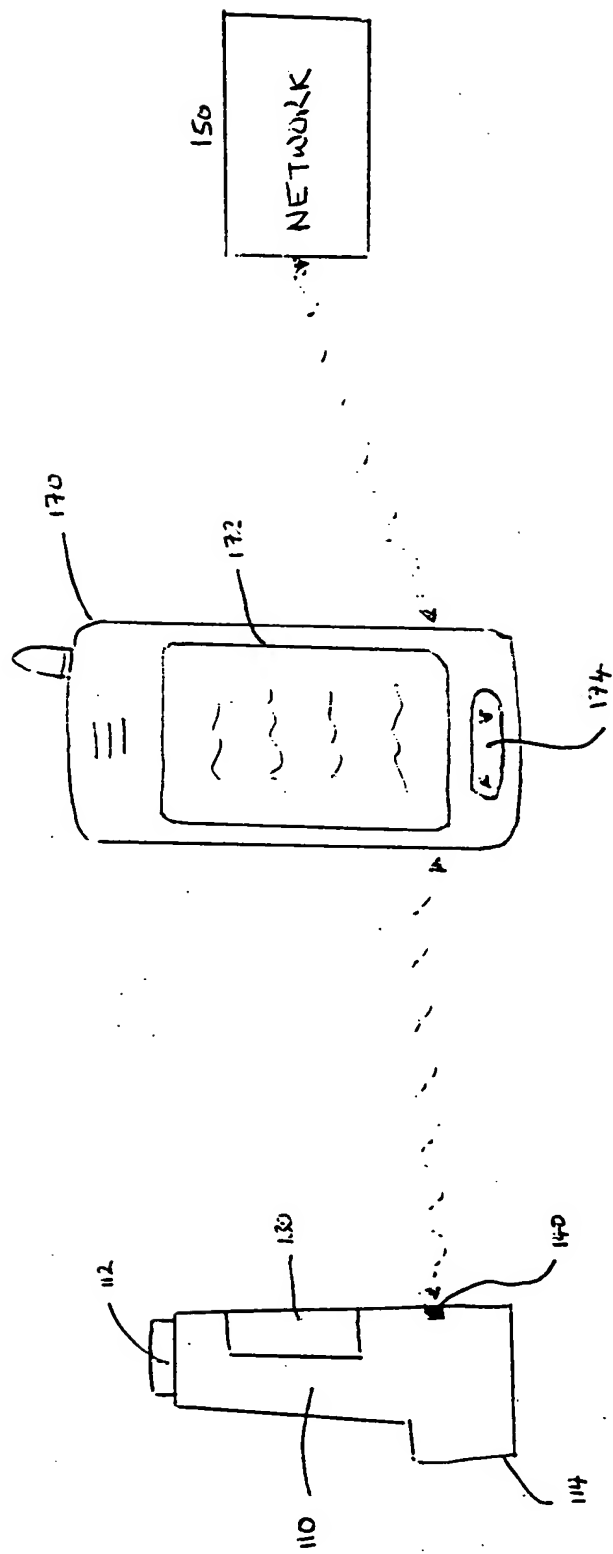
THIS PAGE BLANK (USPTO)

Fig. 1



THIS PAGE BLANK (USPTO)

Fig 2.



THIS PAGE BLANK (USPTO)